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Matthews, Judy H. and Becker, Karen L. (2009) *Innovation and learning for sustainable competitive advantage : preliminary findings*. In: 23rd Annual Australia and New Zealand Academy of Management Conference (ANZAM 2009), 1-4 December 2009, Southbank, Melbourne.

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## **Innovation and Learning for Sustainable Competitive Advantage:**

### **Preliminary Findings**

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## **Innovation and Learning for Sustained Competitive Advantage: Preliminary Findings**

### **ABSTRACT**

*Achieving and sustaining competitive advantage is a major challenge for firms in today's dynamic global marketplace. The notion of sustained competitive advantage has been investigated through a number of paradigms, from the resource based view of the firm to dynamic capabilities. This paper reports preliminary findings from research which investigates the characteristics of innovative firms that have demonstrated competitive advantage over time, targeting factors that contribute to the firm's performance. Key factors to sustaining competitive advantage include working with demanding customers, team based organizational cultures, engaging in challenging projects to make new to the world products, and using projects to generate the necessity for learning by doing, learning by using and learning by interacting in new product and process development.*

Keywords: competitive advantage, continuous improvement, continuous innovation, new product development,

### **INTRODUCTION**

Firms and their performance in the marketplace have been investigated through a number of paradigms, from the resource based view of the firm (Barney, 1991, 2001) to dynamic capabilities (Eisenhardt & Martin, 2000; Li & Tsai 2009; Rothermael & Hess, 2009; Teece, Pisano & Shuen, 1997). The resource based view (RBV) contends that in order for the resources and capabilities of a firm to provide superior performance, they must be (1) valuable in the sense of enabling a firm to exploit its environmental opportunities (and/or neutralize its threats), (2) rare among its current or potential competitors, (3) costly to imitate, and (4) without close strategic substitutes (Barney, 1991). Kay (1995) extended the resource based view of the firm arguing that the internal attributes or the resources and capabilities of the firm could be obtained through the firm's relational architecture, reputation, innovation, and strategic assets.

Innovation has been consistently identified as an essential component of a firm's sustainable competitive advantage (Barney, 1991; Peteraf 1993) and the development of dynamic capabilities (Rothermael & Hess 2009). However the ways in which firms undertake innovation to sustain their competitive advantage has to a large extent not been explicitly researched, and this gap in the literature seems worthy of further attention. The aim of this paper is to identify some of the characteristics of successful firms and progress understandings of the strategies and practices used by

such firms to sustain their competitive advantage through continuous innovation. We investigate ways in which innovative firms encourage innovation and continuous improvement to achieve and sustain competitive advantage. This paper reviews existing research and literature to target specific characteristics of innovation and their contribution to a firm's sustainable competitive advantage. First we briefly examine notions of innovation and its relationship to sustainable competitive advantage. Secondly we frame a research project and present some preliminary findings from in-depth case studies of two Australian firms from two different industries – video games and architectural products. Finally we discuss implications of these practices for firms seeking to sustain their competitive advantage.

Our contribution to the literature linking innovation to a firm's sustained competitive advantage identifies the importance of working with demanding customers and undertaking challenging projects to make new to the world products, where such projects generate the necessity for learning by doing, learning by using and learning by interacting. Team based organizational cultures infused with a climate of engagement and enthusiasm and the continual involvement of the CEO and senior management at all levels of strategy development, operations, monitoring and information gathering and application at the project and organizational level are also found to be important contributing factors.

## **INNOVATION AND COMPETITIVE ADVANTAGE**

Innovation is generally considered to be some novelty or newness that has economic or commercial value, rather than a good idea that is new to a firm or industry. Innovation is defined as introducing or improving products, processes, defining or re-defining market positioning or altering the dominant paradigm for the firm (Tidd, Bessant, & Pavitt, 2005). Innovation is both a process and an object, an idea or practice, and is found in low technology firms as well as high technology firms and involves commercially viable application (Herbig & Kramer, 1993) doing things better and/or doing things differently (Francis & Bessant, 2005).

Our focus is on identifying factors which may assist organisations to achieve sustainable competitive advantage and build capacity for ongoing innovation. Organisational theorists contend that, for a mature organisation to develop the capacity for sustained innovation, it must successfully make these ‘innovation to organization’ connections in three key areas: “1) make resources available for new products; 2) provide collaborative structures and processes to solve problems creatively and connect innovations with existing businesses and 3) incorporate innovation as a meaningful component of the organization’s strategy” (Dougherty & Hardy 1996: 1122). Environments in which innovation is likely to occur contain an atmosphere of continuous renewal and a climate for experimentation. Firms that find ways of preventing their core competencies from becoming core rigidities (Leonard- Barton 1995) and promote continuous learning from successes as well as failures are likely to sustain their competitive advantage.

Research on innovation in a service industry context investigated innovation as a combination of both creativity and implementation, with a focus on both the production of novel and useful ideas that improve effectiveness as well as methods used to put the creative ideas in practice (Lyons et al. 2007). Here competing through innovation in services was found to be more pervasive and distributed throughout the company than competing on innovation in physical products or technology. Innovation in services was more fluid and continuous rather than discrete, and hiring programs and progression in the company was linked to the fit of potential recruit’s values with the firm’s values as well as taking a leadership role in innovation (Lyons et al. 2007). Indeed the potential for organizations to engage in innovation throughout many aspects of an organisation has been a recent focus of research. Defining innovation as creating value for customers, Sawhney, Wolcott & Arroniz, (2006) carried out a review of the academic literature as well as interviews with managers responsible for innovation-related activities at large companies. They suggest that managers should think in a holistic way of the multiple possible dimensions through which their organisations can innovate (Sawhney et al. (2006).

### **Innovation as a social process and a learning process**

Innovation has long been understood as both a social and a technical process (Kline & Rosenberg, 1986). Their overview and analysis of innovation clearly articulates relevant collaborative and

interactive learning processes as well as the importance of non-R&D inputs such as innovation design activities, engineering developments and experimentation training and exploration of markets for new products. Tang (1998) proposes an integrative model of innovation in organizations using the six constructs of information and communication, knowledge and skills, behaviour and integration, project raising and doing, guidance and support and the external environment.

The fast changing turbulent environment faced by firms engaged in innovation has shaped their organisational structure into organic forms for fast response (Burns & Stalker 1994) and also highlighted social processes of learning. Learning is an essential component of the innovation process and encompasses learning by discovering, learning by doing and learning by testing and provides opportunities for organizational learning. The principles required for innovation include, vision, foresight, stretch goals, empowerment, communications and rewards and recognition (Van de Ven, Angle & Poole, 2000: 198-200).

Understanding innovation as a social process tends to highlight the importance of recruiting and selecting talented people and managing their motivation, development, and careers. Katz (1964) identified that organizations must motivate their members to perform three types of behaviour: (1) to join and stay (2) to perform reliably in a prescribed manner, and (3) to perform such behaviours as are necessary to fill the gaps between what the organization can anticipate and what it cannot, which Angle (1989) describes as organizational innovation. The necessity for individuals to have both ability and motivation to undertake innovative work, identified by Angle (1989) remains the challenge for organizations and to enable, motivate and sustain the organizational practices for interactive processes to be maintained. In summary, our examination of literature on organizational innovation highlights the importance of learning at the individual, project and organizational level and the necessity for systems which enable and facilitate continuous learning. It also indicates a variety of evolving models of innovation which have moved from a strong narrow focus on technology to a broader perspective which values technology in the service of connectivity and responsiveness to demand and the creation of new markets.

Most discussions of organisational innovation highlight the importance of learning (Cohen & Levinthal, 1989; Drucker 1985; Francis & Bessant, 1995; Kline and Rosenberg, 1986). Recent work by Jensen et al (2007) differentiates between a science and technology and innovation (STI) mode of practice and an experienced-based mode of learning based on doing, using and interacting (DUI). Doing, using and interacting are regularly used in processes such as engineering design practice, which involves developing solutions to problems. Jensen et al argue that the DUI mode is acquired for the most part on the job as employees face ongoing challenges that confront them with new problems, where, the process of finding solutions to these problems “enhances the skills and knowhow of the employees and extends their repertoires” (Jensen et al. 2007: 683-4). Learning by doing, learning by using, learning by interacting (DUI) can be intentionally fostered by building structures and relationships which enhance and utilize learning by doing, using and interacting through organisational practices such as project teams, problem-solving groups and job and task adaptation and closer interaction with users of products and services outside the organisation” (Jensen et al 2007).

The aim of this paper is to identify some of the characteristics of successful firms and progress understandings of strategies and practices used by such firms to maintain continuous innovation and maintain competitive advantage. The research question addressed was: “In what ways does the organisation encourage innovation and continuous improvement to maintain its sustainable advantage?” Based upon this research question, the research project gathered data from case organisations that have demonstrated sustainable competitive advantage over time and are recognised as leading innovating organisations within their industries. The challenge for researchers is to identify which combinations of processes and practices lead to improved performance and sustained competitive advantage. While some clear findings will identify important practices and their combinations, acceptance and appropriate application of these practices will still require an organisational culture which values review and renewal of systems and practices (Drucker, 1985), and openness and experimentation.

## RESEARCH DESIGN AND METHODS

The research takes an exploratory case study approach with semi-structured interviewing and archival documentation as the predominant data collection methods. Case studies have the ability to probe deeply complex phenomena being considered in an attempt to reach some generalisations (Burns, 2000), and are considered particularly appropriate for emerging areas (Eisenhardt, 1989; Yin, 2003). Organisations selected for inclusion in this study have demonstrated sustainable competitive advantage over the last decade. Companies were identified through recommendations from experts in the field and a web search of winners of Innovation Awards. To ensure objective measures of innovation, these cases were selected on the basis of having been recognized nationally and/or internationally for their innovation performance. Both firms selected for this study are engaged in developing new to the world products for international markets, have demonstrated successful performance over at least ten years out and the primary organization is established and based in Australia.

Data collection involved contacting conducting semi-structured interviews with CEO's and senior HR Director and accessing relevant organizational documents. The interviews were designed to identify current organization strategies related to development innovation strategies and practices used by these firms. These nature of these practices were explored to identify how they are initiated and implemented, and the perceived impact of these practices on building innovation capacity. Interviews lasted approximately 2 hours each were recorded and later transcribed for analysis. Content analysis of the data was conducted to identify issues common to both companies and to contrast different approaches. A summary of these cross-case findings follow a discussion of two cases from two very different industries.

## FINDINGS AND DISCUSSION

### "GameCo"

GameCo was founded in 1999 by the current CEO and Creative Director who each had a different passion; one the gaming industry and the other, photography. Together they created a company that would develop new, exciting games for PCs and consoles. Since that time, the company has grown



exponentially, with three capital city locations in Australia. Even though the growth has meant extending beyond the small team environment of the early days, the co-founders are still extremely committed to remembering their origins; and the employees are still located in the original building where the company began, albeit with a much expanded presence. The company has received numerous industry awards for their products, as well as twice winning the Premier's Export Award for Arts and Entertainment.

The business strategy is based on developing original intellectual property in the form of video games (games design) and the key aspect of the business game design, is organized on a project basis. Project leaders (referred to as producers) are given extensive freedom in terms of choice of team and approach to development. The company has approximately 340 staff, with most of the organization operating on a team structure. In addition to the administrative and professional staff, the company is divided into production teams, as well having a technical department encompassing quality assurance, and other individual staff such as a studio manager. Unlike many of their competitors in this industry, the firm minimizes the number of fixed term contracts for staff, preferring to give employees a level of certainty about employment.

### **Learning at GameCo.**

Learning at GameCo includes learning by doing, learning by using and learning by interacting. GameCo senior staff state that their company hires the best and most suitable candidates for their projects and then creates an environment where staff can generate good ideas which can then be developed into video games for consoles and PCs creating opportunities for learning and fun. GameCo invests in the continuing development of staff "keeping abreast of what people are doing, to push the envelope on that technology, and looking at third party applications, looking at what ... Because aside from the actual game development, we have a whole other field of people developing tools to make the games." "It's still creative. It keeps them interested, it means that they are learning, they're learning new techniques, they're learning – it's maintaining that stimulus and that interest. Because eventually they'll put that to good use, where we actually get a game and they'll start developing".

*Learning by doing.* Learning by doing is particularly encouraged: “Obviously you learn to do things, and the only way you learn is by actually doing it: So you’ve got to become smarter and cleverer about how you use that technology”. Staff learn during projects by using their knowledge and skills in their projects “R&D happens in every producer project”. Staff also learn between projects when experimenting with other products. “So, between projects we do have a period where we’re able to let the guys do the [experimenting] do the research, look at how other people – a lot of time is spent looking at other games, new releases, looking at how they’ve done certain things – there are certain things that we know are going to cause us headaches, whether it be lighting, or shaders or what-have-you. There’s always a technical aspect that someone, somewhere is doing it slightly different, and getting a better result.” “So it’s not just game development, it’s actually all the tools and all the programs and everything else that go behind it. Between projects they spend will spend months looking at tech(nology), taking it to pieces, working out how they did it, and then trying to build it, and improve on it, and do it better.”

*Learning by using:* Learning to use the technologies can lead to later benefits. “Because we have that restriction on the hardware side, when we can’t open up the X-Box and put more memory in, or anything like that, you’ve got to work within those boundaries. So that in-between project is actually having the time to try it out, to play around with them. It’s very important. We have a team that spends a huge amount of time doing research and exactly that, and taking that information and methodology that other companies are using, and we put that in our own engine. But the cutting edge of it usually comes down to the guys on the floor, who’ve seen something cool, and say, wow, let’s have a look at that.” The projects build in variety and well as clear outcomes: “And it’s also that I think it’s that the project cycle period means that you’re not doing the same thing for the rest of your life.”

*Learning by interacting.* Learning is a social process and for GameCo learning needs to be shared to maximize the benefit for the firm. “It’s a way of also disseminating information within the company, if you start looking at the R&D, then other people get involved. It reduces the risk of exclusive knowledge, that person that knows how to do it; it dissipates it throughout. Our teams are

broken up into little areas, into little teams, and they all get involved, so that information gets disseminated throughout the company”. Learning also occurs at the end of the project: “It’s that ‘tween time, between you finishing one project and you’re going onto another. All the guys work incredibly hard, long hours, a lot of overtime. And they’ll take some time off and then they’ll come and do some R&D or they’ll play games, they’ll look at how other people are doing it. For inspiration. And work on what we call the RFBs, and proposals for the next game.”

GameCo is a firm with high staff retention. However the relaxed and fun atmosphere is only one aspect of the business and it is contrasted with the need to work hard to create world-class products: “the relaxed atmosphere of the company”. I mean, I could come to work in shorts and thongs. So there is – it is certainly a very nice and relaxed environment to work in. But it is also a serious business. Yes, you’re going to have fun, yes, you’re making games, and it’s a fun thing to be involved in. But guess what, it’s a multimillion dollar project and it’s deadly serious. Beneath the surface we are ...A business.”

### **“ArchiDoors”**

ArchiDoors originally commenced operations in 1951. After a significant turnaround and renewal in 1997 the company revised its product offerings and moved into new markets to establish themselves in a unique position, with a new focus on R&D to develop original, niche architectural products. ArchiDoors has received many awards for innovation, the latest being the 2008 National Business of the Year, and 2008 National Innovation Award. In 2008, they were also winners of an US Industry Award for Windows and Doors. The organization has a number of sections, with the R&D integrated with manufacturing as the Product and Engineering department. The company has four general managers in Asia Pacific, Europe, North America and Nanjing with 50% of staff in Australia but has operations in Chicago, Birmingham and Nanjing. Design and manufacturing is still carried out in Australia where products have unique specifications or are larger products going into the Australian

market. Most labor-intensive production is carried out in Nanjing due to labor costs and some components may be manufactured in China and then imported back to Australia for assembly.

*Innovation in embedded in the culture of this organisation.* “We push the boundaries. When we hire people it’s in the recruiting presentation that we do. It’s a case of saying, if you like working in a highly-structured environment doing the same stuff day in, day out, you’re going to hate it here, don’t join us. If you want to take on challenges and do things differently then you’ll love it here and that’s built in from day one. All these agreed outcomes are not about doing the same thing day after day. It is about taking on additional capabilities, growing into a new role or doing whatever you are but doing it on a different product or a different process and it’s all about that, managing that change.”

*Learning at ArchiDoors* is carried out as learning by doing by undertaking challenging projects, and through learning by using and interacting in interdisciplinary teams and with demanding customers to create new solutions. ArchiDoors is strongly based on a ‘team culture’ and we try and be as informal as we can”. R and D projects teams change in size and composition to meet the demands of new projects as they arise. “So we’ll just break that team and reconstitute it with the right mix of skills for whatever you’re trying to tackle. We do a fair range of projects from stuff, you know, just take a left-handed hinge and make it right handed and we try – you get the idea. Right through to the big platform products, you know, four-year projects, no idea how big it is or how long, no idea what the solution is”. The firm faces many challenges. “We have R and D but that flows across the whole organisation, how you get a set of multi-currency, multi-currency accounts that comply with 30 statutory authorities and have them out by the fifth working day of the month. No idea. Well, we need to do something differently, otherwise it will take you six weeks to do it and we’ve only got six days.”

The CEO has faith in his staff and encourages learning from failures as well as mistakes. “I guess probably the thing that reinforces that is being prepared to allow people to make mistakes. If you’re putting up a big goal and they don’t hit it, then flailing them for failing to succeed is not going to work.” “We hire great people and get out of the way, but giving them the authority to go get a job

done and living with whatever they come up with ..... but I know that they're going to come up with the best solution. They're going to come up with a solution that, in the organisation, we will work with". Further information about GameCo and ArchiDoors is summarized in Table 1.

Insert Table 1 here

Both companies have demonstrated successful performance in new product development in highly competitive international marketplaces for ten years. Both companies are engaged in work that is developed as projects with extensive use of team structures to develop new ideas and convert them into saleable products, with multiple continuous interactive learning processes. Both CEOs played important roles in their companies. For example in GameCo, the CEO was the agent who established opportunities for gaming projects from international sources, and these briefs were then presented to the company as possible projects for development. In ArchiDoors the CEO actively sets the strategic direction of the firm, works with his directors in international offices and monitors and shapes the performance of the firm in transparent ways that encourages his staff to engage in 'managing the business'. Both firms emphasize hiring good staff and getting out of their way, providing guidance and autonomy but monitoring how things are working out at the team and organizational level. Both CEO's appear to ensure that the culture and climate of their companies involve strategies and practices which structure and encourage learning and interaction. Learning by doing, using and interacting is carried out by developing expertise through problem solving, sharing past successes and knowledge sharing.

*Limitations.* The study provides preliminary findings from interviews with senior managers and CEO from two successful firms engaged in new product development in very different industries. These early findings from a small number of selected firms are indicative rather than prescriptive and provide the opportunity to shape further investigations into firms and the approaches they use to sustain their competitive advantage. The cross-sectional nature of this research provides early information which will be extended in further cross-sectional and longitudinal research studies.

## CONCLUSIONS AND IMPLICATIONS FOR MANAGERS

Our preliminary findings indicate the importance of a number of factors which appear to sustaining the firm's competitive advantage. These factors include working with demanding customers, developing challenging projects to make products that are not just new to the industry but new to the world, using projects to generate the necessity for learning by doing, learning by using and learning by interacting, and employing team based organizational cultures to infuse a climate of engagement and enthusiasm. Both firms articulated a strategic vision which is embedded in the company and its organizational culture and climate; with a tight but transparent monitoring and control of their business, creating a team culture and encouraging all employees to see themselves as active partners in creating new great works. What is also significant in these companies are the processes which embed clarity of strategic vision and purpose yet maintain autonomy at the project level, and flexibility and responsiveness to their customers at the organizational level, supported by the structures and relationships which enhance and use learning by doing, using and interacting.

This investigation of processes engaged by two innovative firms to sustain their competitive advantage confirms processes identified in previous research (Francis & Bessant 1995; Jensen et al. 2007; Matthews, 2002; Tidd et al, 2005). Specifically these firms engaged in processes of managing for sustainable competitive advantage by creating products and processes that are valuable, rare and costly to imitate and without close strategic substitutes. The firms have also used innovation and the firm's internal and external relational architecture to develop strategic assets to achieve and sustain their competitive advantage. The continued involvement of the CEO and senior management at all levels of strategy development and operations, monitoring and information gathering and application at the project and organizational level is also observed. Findings from this research will inform further research on the roles of CEO's and senior managers, their influence on organizational culture and climate in encouraging innovation and learning for sustained competitive advantage.

**Table 1. Information about Firm Case Studies**

	GameCo	ArchiDoors
Business type	Largest independent Australian video game developer focused on international market	Architectural design and manufacturing ; unique architectural doors and screens developed for international market
Strategy	Leading edge developer of technologies and video games for the current gen platforms, next gen and handheld platforms.	Works with demanding customers; Market leader in niche architectural doors: growth strategy; 30% growth every year for last ten years
R&D activities	R&D carried out in projects, Competitor products, use of downtime, no dedicated function	R&D integrated function with manufacturing department; project based; flexibility of membership with job rotation
Workforce planning	Keep quality people employed with work – offers job security in fast changing often contract market	Workforce employed as new offices are established; principle of “Local companies run by local people”;
Recruitment & Selection	International recruitment for top staff; via industry contacts, entry level via universities and internships; many applicants for positions;	International recruitment for General Managers for international offices; reputation, internal recommendations or Message given during recruitment: “ If you want to take on challenges and do things differently you will love it here”
Work design Projects and Teams	Teams an integral part of the structure, where project teams can vary from 30 to 80 people; Projects from 6 months to up to five years; project cycles generates variety	Team based multi-size projects; Teams from 3- 15 members focused around tasks; generating new products and solutions
Learning: Learning by Doing Learning by Using Learning by Interacting	Learning by doing; engaging in challenging projects; Time pressures self-directed experimentation and learning encouraged; Opportunities for skill development; explore the latest technology e.g. X-Box 60’s; attending international conferences between projects;	Learning by Doing and Using: Encourage learning through challenging projects; ongoing skill and knowledge development; work with demanding customers “Hire the best person for the organization not just the position, manage their work to avoid burnout”; Learning by interacting: Integration of R&D staff, job rotation; multiple team formations; links with customers
Culture and Climate	Team based work; focus on creating a culture and climate – a team culture; to make things happen such that employees not only feel part of the firm’s purpose but are also valued for their contributions; Formal and informal processes; organized on team basis and milestone basis; rewards usually the end of the project – celebrate success e.g. CEO bought X-Box 60’s for whole team	Team culture; clear set of organizational values and goals; importance of climate of enthusiasm energy and involvement; multiple informal interactions on regular basis, inclusive approach to information and knowledge sharing  Informal reward and recognition to celebrate successes; Formal awards such as Four Employee of the Year Awards around company’s core values;

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